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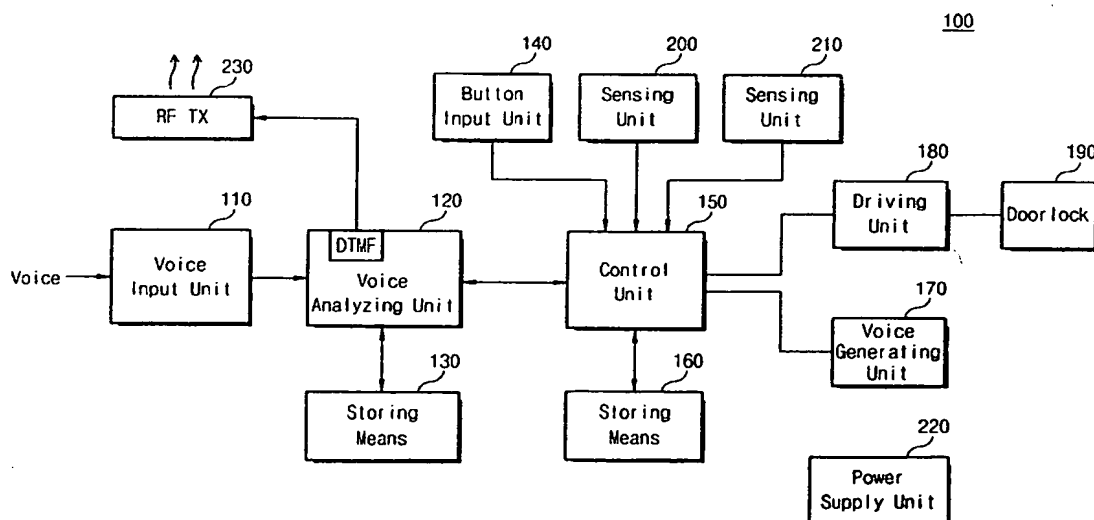
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(54) Title: VOICE RECOGNITION DOORLOCK APPARATUS



(57) Abstract: A voice recognition doorlock apparatus includes a control unit for controlling the lock state of a doorlock to be unlocked by a doorlock driving unit only when a currently inputted digital voices signal matches a specific voice signal stored in first storing unit and matches input key signals stored in second storing unit.

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Title of Invention

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VOICE RECOGNITION DOORLOCK APPARATUS

5 Technical Field

The present invention relates to a doorlock and, more particularly, a voice recognition doorlock apparatus for controlling doorlock by means of voice authentication.

10 Background Art

Generally, the doorlock is that a door is opened/closed by a mechanical method. A key is inserted into a key insert hole of the doorlock, and the inserted key is rotated to open a door. A disadvantage of the doorlock using a key is that if the key is lost, the door cannot be
15 opened/closed. Another disadvantage is that an outsider may use a key without permission to trespass on a home or office. Although the key is not used without permission, a skilled in the art can readily unlock the doorlock to open a door.

To overcome these disadvantages, button-type digital doorlock
20 and fingerprint identification doorlock have been suggested. In case of the button-type digital doorlock, buttons are pressed to set a password. If the set password is divulged to an outsider, it is hard to prevent his/her trespass. In case of the fingerprint identification doorlock, high-cost apparatuses are used to recognize and process fingerprints. Thus,
25 lots of installation cost is required.

Disclosure of Invention

According to the present invention, a voice recognition doorlock apparatus comprises first input means, having a plurality of input keys, for outputting input key signals corresponding to the input keys whenever the input keys are pressed; second input means for receiving
5 an analog voice signal and converting the received analog voice signal to a digital voice signal; voice analyzing means for receiving the digital voice signal to extract a specific voice signal from the digital voice signal in a registration mode and storing the extracted specific voice signal in first storing means as an ID of a registration-desiring user;
10 control means for storing input key signals which is inputted through the first input means in the registration mode and indicates a password; and doorlock driving means for locking or unlocking a doorlock according to the control of the control means. The voice analyzing means determines whether a currently inputted digital voice signal
15 matches the specific voice signal stored in the first storing means to generate a first flag signal, as a determining result. When the currently inputted voice signal matches the specific voice signal stored in the first storing means, the control means determines whether the input key signals currently inputted as the password matches the input key signals
20 stored in the second storing means in response to the first flag signal. When the currently input key signals matches the input key signals stored in the second storing means, the control means control the door lock to be unlocked by the doorlock driving means.

The voice recognition doorlock apparatus further comprises voice
25 generating means for generating a voice signal according to the control of the control means; and first sensing means for sensing an open/close state of a door and transmitting the sensing result to the control means.

A part of the input keys are disposed outside a door, and the other input keys are disposed inside the door. The voice recognition doorlock apparatus further comprises second sensing means for sensing an illegal handling of the input keys disposed inside the door and transmitting the sensing result to the control means. When the input keys disposed inside the door are not illegally handled by a person, the control means controls the voice generating means to output a warning sound in response to the sensing result transmitted from the second sensing means.

10 The voice analyzing means includes a dual tone multi-frequency (DTMF) generator. When the control means generates a second flag signal indicating that the door is forcibly opened, the DTMF generator generates a MTMF signal. The voice recognition doorlock further comprises radio transmitting means for transmitting the DTMF signal.

15 The input keys include an interphone key. When the interphone key is pressed, the control means controls the voice generating means to enable a user to output a predetermined voice message signal.

When the interphone key is pressed, the control means controls the voice analyzing means, the voice generating means, and the first input means to enable the user to a message. The input keys include a record key. When the record key is pressed, the control means controls the voice analyzing means, the voice generating means, and the first input means to enable the user to a message.

25 Brief Description of Drawings

FIG. 1 is a block diagram of a voice recognition doorlock apparatus according to the present invention;

FIG. 2 is a flowchart for explaining the registration procedure of the voice recognition doorlock apparatus according to the present invention;

FIG. 3 is a flowchart for explaining the authentication procedure of the voice recognition doorlock apparatus according to the present invention;

FIG. 4 is a flowchart for explaining a door bell and a message recoding function of the voice recognition doorlock apparatus according to the present invention;

FIG. 5 is a flowchart for explaining a family message recording function of the voice recognition doorlock apparatus according to the present invention; and

FIG. 6 shows the contents of messages used in FIG. 2 to FIG. 4.

Best Mode for Carrying out the Invention

Referring to FIG. 1, a voice recognition doorlock apparatus 100 according to the present invention includes a voice input unit 110, a voice analyzing unit 120, first storing means 130, a button input unit 140, a control unit 150, second storing means 160, a voice generating unit 170, a driving unit 180, a doorlock 190, first and sensing units 200 and 210, a power supply unit 220, and a radio transmitter (RFTX) 230. The power supply unit 220 has a battery and supplies a power to the voice recognition doorlock apparatus 100.

The voice input unit 110 receives an analog voice signal and converts the received analog signal to a digital voice signal. Although not shown in this figure, the voice input unit 110 includes a microphone (or mike) for receiving an analog voice signal and an analog-to-digital converter for converting an analog voice signal to a digital voice signal.

However, it is apparent to a person skilled in the art that the voice input unit 100 may be variously designed using a variety of methods according to designers and applications. The voice analyzing unit 120 extracts a specific voice signal from the digital voice signal outputted from the voice input unit 110 and stores the extracted voice signal in the first storing means 130. Particularly, the voice analyzing unit 120 extracts the characteristic voice of a registration-desiring person in response to the control of the control unit 150 in a registration mode. By the control of the voice analyzing unit 120, the extracted specific voice signal is stored in the first storing means 130. The voice analyzing means 120, in a standby mode, determines whether a currently inputted digital voice signal matches a specific voice signal stored in the first storing means 130 and outputs the determination result to the control unit 150. The first storing mean 130 has a non-volatile memory (e.g., flash memory, EEPROM, etc.) for storing the intrinsic specific voice signal of the registration-desiring person.

Continuously referring to FIG. 1, the button input unit 140 includes a plurality of input keys (not shown). For example, the input keys may include number keys, a register key, a record key, a replay/pause key, an open/close key, an enter key, an interphone key, and so forth. A part of the input keys (e.g., the number keys, the enter keys, and interphone key) are disposed outside a door, and the other keys (e.g., the record key, the replay/pause key, the open/close key, the register key, etc.) are disposed inside the door. These keys will be explained in detail later.

The control unit 150 is connected to the voice analyzing unit 120, the button input unit 140, the second storing means 160, and the sensing units 200 and 210, the driving unit 180, and the voice generating unit 170. The control unit 150 controls a registration procedure, an

authentication procedure, and a message record/replay procedure in response to a key signal corresponding to a pressed one of the input keys of the button input unit 140. For example, in a registration mode for registering a user's ID, a personal password, and a family password, the control unit 150 makes the voice analyzing unit 120 extract a specific voice signal (to be used as a user's ID) from the inputted digital voice signal in response to a registration signal (which is a signal generated when a registration key is pressed) inputted through the button input unit 140. In the registration mode, the control unit 150 stores the personal password/family password, inputted through the button input unit 140, in the second storing unit 160. In a standby state, the control unit 150 determines whether key signals inputted through the button input unit 140 as a password matches the personal password/family password stored in the second storing means 160.

The driving unit 180 locks or unlocks the doorlock 190 in response to the control of the control unit 150. For example, when a currently inputted digital voice signal matches a specific voice signal stored in the first storing means 130 and key signals inputted through the button input unit 140 as a password match a personal password stored in the second storing means 160, the control unit 150 outputs doorlock unlocking information to the driving unit 180. The driving unit 180 unlocks a lock state of the doorlock 190 in response to the doorlock unlocking information from the control unit 150. The first sensing unit 200 senses whether a door is opened or closed and transmits the sensing result to the control unit 150. The control unit 150 controls the voice generating unit 170 to output a needed voice message according to the sensing result. The second sensing unit 210 senses whether input keys disposed inside the door are illegally handled and transmits the sensing result to the control unit 150. For example, the second sensing unit 210 may have an

infrared sensor for sensing whether the input keys disposed inside the door are pressed by a person or a tool handled by an outsider.

As shown in FIG. 1, the voice analyzing unit 120 includes a dual tone multi-frequency generator (hereinafter referred to as "DTMF generator"). When the control unit 150 informs the fact that a door is forcibly opened, the DTMF generator of the voice analyzing unit 120 generates a DTMF signal in response to the information of the control unit 150. The generated DTMF signal is to be transmitted to the outside (e.g., guardroom) through the radio transmitter (RFTX) 230. The forcible opening of the door may be sensed by a variety of methods (e.g., sensing an excessive movement of a door knob).

According to the above-described voice recognition doorlock apparatus 100, in order to unlock the lock of the doorlock, a voice signal of a person wanting to go in and out must match a registered specific voice signal and an inputted password must match a stored password. That is, a door is opened by combination of voice-based authentication and password-input authentication (or a dual security system using voice input and button-type password input is realized) to prevent the trespass of outsiders.

A registration procedure of the voice recognition doorlock apparatus according to the present invention will now be described with reference to FIG. 2.

To register a user's ID and personal/family password, the user (or a registration-desiring person) must press a register key of a button input unit 140. When a registration key signal (or registration signal) is inputted (S100), a control unit 150 controls a driving unit 180 in response to a registration signal. According to this control, the control unit 180 unlocks a lock state of a doorlock 190. After the lock state of the doorlock 190 is unlocked, the control unit 150 controls a voice

generating unit 170 to output a voice signal of a third message (see FIG. 6, "door open"). This procedure is carried out in step S110. After the third message is outputted, it is determined whether predetermined time (e.g., 10 seconds) passes (S120). If the predetermined time passes, a 23rd message (see FIG. 6, "No. 1 is family password registration, No. 4 is user registration, and No. 0 is replay and delete") is outputted (S130).

In step S140, the control unit 150 checks what password is inputted through the button input unit 140. The control unit 150 performs a procedure to register a family password when No. 1 key is pressed, performs a procedure to register a personal ID and password when No. 4 key is pressed, and performs a procedure to replay/delete a registered personal ID. This will now be described more specifically.

In case that the No. 1 key is pressed, the voice generating unit 170 outputs a 14th message (see FIG. 6, "press enter key after pressing family password") under the control of the control unit 150. The family password is inputted through the button input unit 140. When the family password is set, successive keys must be pressed within predetermined time (e.g., 10 seconds). If the successive keys are pressed over 10 seconds, this routine returns to step S150 to re-input a family password from the start. This procedure is conducted through steps S160 and S170. The inputted family password is stored in second storing means 160 according to the control of the control unit 150. If the successive keys are pressed within 10 seconds, the control unit 150 determines whether the enter key is pressed as an input end key (S180). If so, the voice generating unit 170 outputs a 16th message (see FIG. 6, "registration end") according to the control of the control unit 150 (S190). In step S200, the control unit 150 determines whether a registration signal is inputted. In case that the registration key is pressed once, the registration procedure is completed. In case that the registration key is not pressed,

this routine advances to step S150 to replay or delete the registered family password and to input a personal ID and password.

In case that No. 4 key is pressed in step S140, the control unit 150 controls the voice generating unit 170 to output a 7th message (see FIG. 6, "speak personal ID") (S210). In this case, the voice analyzing unit 120 makes preparation for analyzing a digital voice signal from the voice input unit 110 by means of communication with the control unit 150. A user speaks a registration-desiring personal ID with his/her voice according to a voice message (S220). An analog voice signal, as a personal ID, is converted to a digital voice signal through the voice input unit 110. The digital voice signal is transmitted to the voice analyzing unit 120. The voice analyzing unit 120 extracts a specific voice signal from the digital voice signal. If an 8th message (see FIG. 6, "speak once more") is outputted (S230), the user speaks the personal ID once more (S240).

In step S250, the voice analyzing unit 120 determines whether corresponding digital voice signals match the personal ID inputted twice. If not match, it is determined whether a personal ID input procedure is repeated twice (S260). If not repeated twice, this routine advances to step S210. If repeated twice, after an 18th message (see FIG. 6, "not registered") is outputted (S270), this routine advances to step S200. In step S250, when the digital voice signals inputted twice match each other, the control unit 150 controls the voice generating unit 170 to output a 15th message (see FIG. 6, "press enter key after pressing personal password"). The personal password is inputted through the button input unit 140. When the personal password is set, successive keys must be pressed within predetermined time (e.g., 10 seconds). If the predetermined time passes, this routine advances from start to step S280 to input a personal password. This procedure is performed in steps S290

and S300. The inputted personal password is stored in the second storing means 160 according to the control of the control unit 150. If the successive keys are pressed, within 10 seconds, the control unit 150 determines whether the enter key is pressed as an input end key (S310).
5 If so, the voice generating unit 170 outputs a 16th message (see FIG. 6, "registration end") according to the control of the control unit 150 (S320). Afterwards, this routine advances to step S200 to determine whether a registration signal (which is a signal generated when a registration key is pressed) for completing the registration procedure is
10 inputted. In case that the registration key is pressed once, the registration procedure is completed. In case that the registration key is not pressed, this routine advances to step S130 to replay or delete the registered family password/personal password and to input a personal ID and password.

15 In case of No. 0 key is pressed in step S140, the control unit 150 controls the voice generating unit 170 to output a 22nd message (see FIG. 6, "delete if pressing enter key during replay"). After the 22nd message is outputted, a voice signal corresponding to the registered personal ID is regenerated (S340). The control unit 150 determines whether the enter
20 key is inputted during replay(S350). If not so, registered voice signals are all sequentially replayed. If so, after deleting the corresponding voice (S360), this routine advances to step S130. In case that registered voices are all replayed, this routine advances to step S130 irrespective of pressing the enter key.

25 An authentication procedure of the voice recognition doorlock apparatus according to the present invention will now be explained with reference to FIG. 3. To open a door after going out, an authentication procedure, which will be explained hereinbelow, must be needed.

The controller 150 determines whether any key is pressed (S400). If any key is pressed, a 7th message (see FIG. 6, "speak personal ID") is outputted through the voice generating unit 170. In this case, the voice analyzing unit 120 makes preparation for analyzing a digital voice signal from the voice input unit 110 by means of communication with the control unit 150. A person wanting to go in and out speaks his/her ID according to the output of a message. An analog voice signal, as a personal ID, is converted to a digital voice signal through the voice input unit 110. The voice analyzing unit 120 determines whether a currently inputted digital voice signal matches a specific voice signal stored in the first storing means 130 (S420). If so, an 11th message (see FIG. 6, "press personal password") is outputted (S430). Afterwards, the control unit 150 determines whether the inputted personal password matches the registered personal password stored in the second storing means 160 (S440).

If the inputted personal password does not match the registered personal password, the control unit 150 determines whether an input procedure is repeated three times or more (S450). If not so, this routine advances to step S430. If so, after generating a warning sound (S460) for predetermined time (for example, one minute), the authentication procedure is completed. If the inputted personal password matches the registered personal password, the control unit 150 controls the driving unit 180 to unlock the lock state of the doorlock 190 and controls the voice generating unit 170 to output a 3rd message (see FIG. 6, "door open") (S470). If the door is closed, the doorlock 190 is automatically locked (S480) and the authentication procedure is completed.

If the inputted personal ID does not match a previously stored ID in step S420, it is determined whether any key is pressed (S490). If not so, it is determined whether the personal ID is repeated three times

(S500). If the personal ID is not repeated three times, this routine advances to S410. If the personal ID is repeated three times, after a warning sound is outputted for predetermined time (for example, one minute) (S510), the authentication procedure is completed. If any key is pressed in step S490, a 14th message (see FIG. 6, "press enter key after pressing family password") is outputted (S520). The control unit 150 determines whether the family password inputted according to the output of the message matches a previously stored password (S530). If so, the procedure advances to step S470. If not so, the authentication procedure is completed.

The steps S490, S520, and S530 are used in case that a personal wants to go in and out by authenticating only a family password in emergency (e.g., it is hard to authenticate a personal password because a personal gets hoarse or suffers from other symptoms).

According to the above authentication procedure, the security of a home or office can be guaranteed. Further, the inconvenience of carrying a key such as mechanical doorlock and the apprehension of divulging a doorlock password are attenuated to enhance the security of a home or office.

An interphone function and a message recording function of the voice recognition apparatus 100 according to the present invention will now be described with reference to FIG. 4. The voice recognition apparatus 100 offers an interphone function. Since the interphone function responds to the visit of outsiders, an immediate action is not needed. Further, the voice recognition apparatus offers the message recording function to record the message that a visitor wants to transmit. The interphone and message recording functions will now be described more fully hereinbelow.

The control unit 150 determines whether an interphone key is pressed (S600). This is achieved by determining whether a key signal corresponding to the interphone key is inputted through the button input unit 140. If the interphone key signal is inputted, the control unit 150 controls the voice generating unit 170 to output a 1st message (see FIG. 6, "who are you"). After predetermined time, the control unit 150 controls the voice generating unit 170 to output a 9th message (see FIG. 6, "No. 1 is record, No. 2 is cancel"). If predetermined time (for example, 10 seconds) passes, the procedure is completed. If not so, it is checked what key is pressed (S640). If No. 3 key is pressed, the procedure is completed.

If the No. 1 key is pressed, the voice generating unit 170 outputs a 2nd message (see FIG. 6, "speak") according to the control of the control unit 150 (S650). The message of a visitor is recorded during predetermined time (for example, 10 seconds) (S660), which is achieved according to the following procedure. For example, the message will be stored in the first storing means 130 under the control of the voice analyzing unit 120. After a 10th message (see FIG. 6, "enter key is end, No. 2 key is replay, and No. 3 key is cancel") is outputted (S670), it is determined checked what key is pressed (S680). This is achieved through the control unit 150. In case that the enter key is pressed, the procedure is completed. In case that No. 3 key is pressed, after a 20th message (see FIG. 6, "cancelled") is outputted (S700), this routine advances to step S620. In case that No. 2 key is pressed, after recording content is replayed (S690), this routine advances to step S620.

A family message recording function of the voice recognition doorlock apparatus 100 according to the present invention will now be described with reference to FIG. 5. The voice recognition doorlock apparatus 100 offers a family message recording function to allow a

person, who goes in after another personal goes out, to record a message. Since the family message recording function leads to user's convenience in a home or office, a message to be transmitted to a next user or a message recorded by a visitor are transmitted to meet user's desire.

5 The control unit 150 determines whether a record key of the button input unit 140 is pressed (S800). If so, the control unit 150 controls the driving unit 180 to unlock a lock state of the doorlock 190 and controls the voice generating unit 170 to output a 3rd message (see FIG. 6, "door open") (S810). It is determined whether the door is opened (S820). This
10 is performed through the first sensing unit 200 and the control unit 150. If the door is not opened for the predetermined time, after the doorlock 190 is closed (S840), the procedure is completed. If the door is opened, it is determined whether the door is closed after predetermined time (S850). This is performed through the first sensing unit 200 and the control unit
15 150. If the door is not closed, the procedure is completed after predetermined time (for example, 10 seconds).

 If the door is closed in step S850, after predetermined time (S870), the control unit 150 controls the driving unit 180 to lock the doorlock 190 (S880). According to the control of the control unit 150, the voice
20 generating unit 170 outputs a 4th message (see FIG. 6, "door close") (S890). The control unit 150 controls the voice generating unit 170 to output a 9th message (see FIG. 6, "No. 1 is record, No. 2 is cancel") (S900). When predetermined time (for example, 10 seconds) passes (S910), the procedure is completed. If not so, it is checked what key is
25 pressed (S920). If No. 3 key is pressed, the procedure is completed.

 If No. 1 key is pressed, the voice generating unit 170 outputs a No. 2 message (see Fig. 6, "speak") according to the control of the control unit 150 (S930). The message of a going-out person is recorded for predetermined time (for example, 10 seconds) (S940). The message

recoding steps are now described. For example, the message will be stored in the first storing means 130 under the control of the voice analyzing unit 120. After a 10th message (see FIG. 6, "enter key is end, No. 2 key is replay, and No. 3 key is cancel") is outputted (S950), it is
5 checked what key is pressed (S960). This is performed through the control unit 150. If the enter key is pressed, the procedure is completed. If the No. 3 key is pressed, after a 20th message (see FIG. 6, "cancelled") is outputted (S980), this routine advances to step S900. If the No. 2 key is pressed, the recording content is replayed (S970) and this routine
10 advances to step S900.

While the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is readily apparent to those of ordinary skill in the art in light of the teachings of this invention that certain changes and modifications may be
15 made thereto without departing from the spirit or scope of the appended claims.

Industrial Applicability

According to the authentication procedure of the invention, the security
20 of a home or office can be guaranteed. Further, the inconvenience of carrying a key such as mechanical doorlock and the apprehension of divulging a doorlock password are attenuated to enhance the security of a home or office.

Since an interphone function is offered to respond to the visit of
25 outside visitors, the immediate response is not needed. Further, complex interconnection is removed to achieve a beautiful appearance and meet a user's desire. Due to the interphone function, visitors can record their messages.

Since a family message recording function is offered, the convenience of a user in a home or office is promoted to transmit a message to be transmitted to the next user or a message recorded by an outside visitor while he/she is absent. Thus, user's desire can be

5 satisfied.

What is claimed is:

1. A voice recognition doorlock apparatus comprising:

5 first input means, having a plurality of input keys, for outputting input key signals corresponding to the input keys whenever the input keys are pressed;

second input means for receiving an analog voice signal and converting the received analog voice signal to a digital voice signal;

10 voice analyzing means for receiving the digital voice signal to extract a specific voice signal from the digital voice signal in a registration mode and storing the extracted specific voice signal in first storing means as an ID of a registration-desiring user;

control means for storing input key signals which is inputted
15 through the first input means in the registration mode and indicates a password; and

doorlock driving means for locking or unlocking a doorlock according to the control of the control means,

wherein the voice analyzing means determines whether a
20 currently inputted digital voice signal matches the specific voice signal stored in the first storing means to generate a first flag signal, as a determining result;

wherein when the currently inputted voice signal matches the specific voice signal stored in the first storing means, the control means
25 determines whether the input key signals currently inputted as the password matches the input key signals stored in the second storing means in response to the first flag signal; and

wherein when the currently input key signals matches the input key signals stored in the second storing means, the control means control the door lock to be unlocked by the doorlock driving means.

5 2. The voice recognition doorlock apparatus of claim 1, further comprising:

voice generating means for generating a voice signal according to the control of the control means; and

first sensing means for sensing an open/close state of a door and
10 transmitting the sensing result to the control means.

3. The voice recognition doorlock apparatus of claim 1, wherein a part of the input keys are disposed outside a door and the other input keys are disposed inside the door.

15

4. The voice recognition doorlock apparatus of claim 1, further comprising:

second sensing means for sensing an illegal handling of the input keys disposed inside the door and transmitting the sensing result to the
20 control means.

5. The voice recognition doorlock apparatus of claim 4, wherein when the input keys disposed inside the door are not illegally handled by a person, the control means controls the voice generating
25 means to output a warning sound in response to the sensing result transmitted from the second sensing means.

6. The voice generating doorlock apparatus of claim 5, wherein the voice analyzing means includes a dual tone multi-frequency (DTMF) generator; and.

wherein when the control means generates a second flag signal
5 indicating that the door is forcibly opened, the DTMF generator generates a MTMF signal.

7. The voice recognition doorlock apparatus of claim 6, further comprising radio transmitting means for transmitting the DTMF
10 signal.

8. The voice recognition doorlock apparatus of claim 2, wherein the input keys include an interphone key; and

wherein when the interphone key is pressed, the control means
15 controls the voice generating means to enable a user to output a predetermined voice message signal.

9. The voice recognition doorlock apparatus of claim 8, wherein when the interphone key is pressed, the control means controls
20 the voice analyzing means, the voice generating means, and the first input means to enable the user to a message.

10. The voice recognition doorlock apparatus of claim 9, wherein the input keys include a record key; and
25 wherein when the record key is pressed, the control means controls the voice analyzing means, the voice generating means, and the first input means to enable the user to a message.

Fig. 1

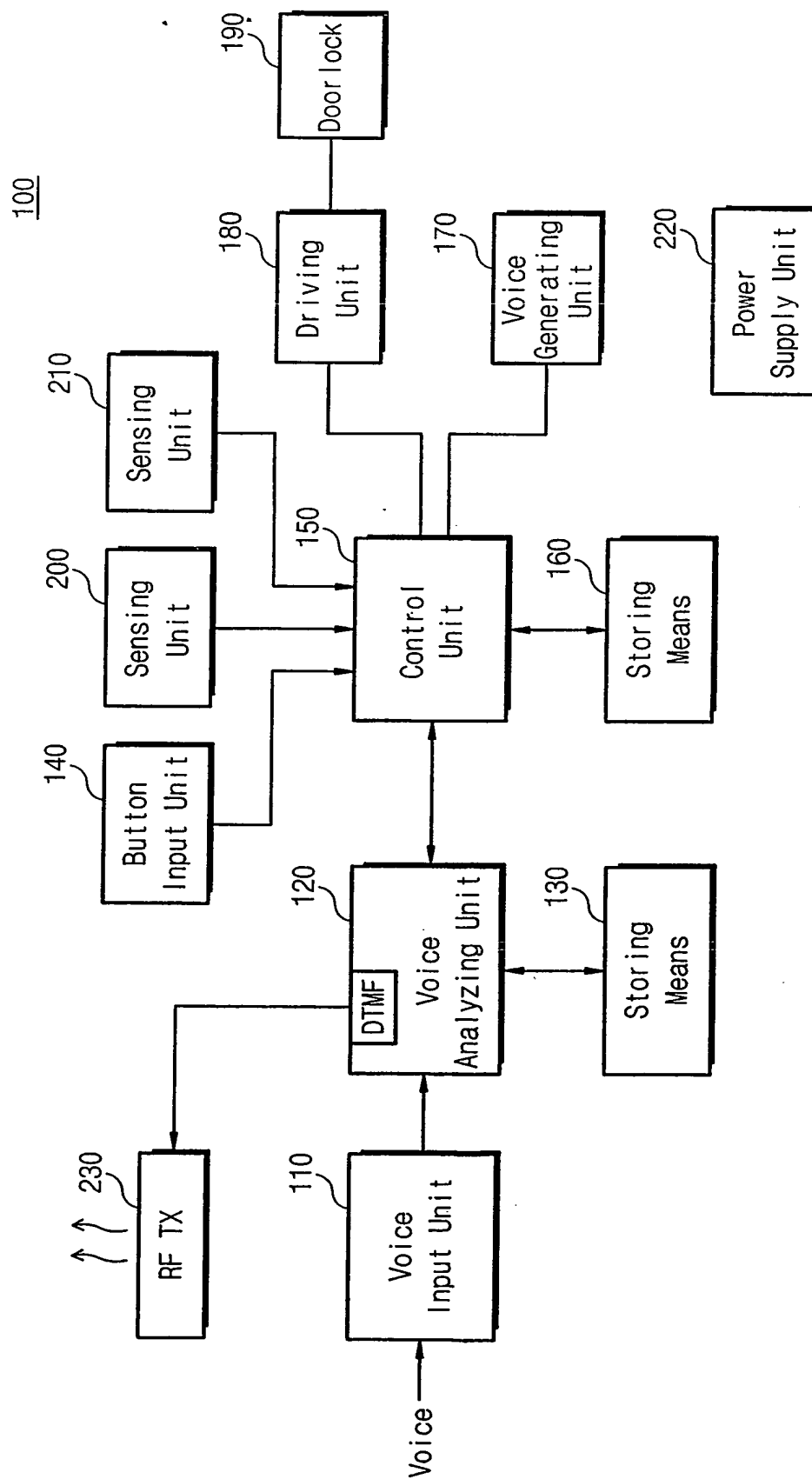
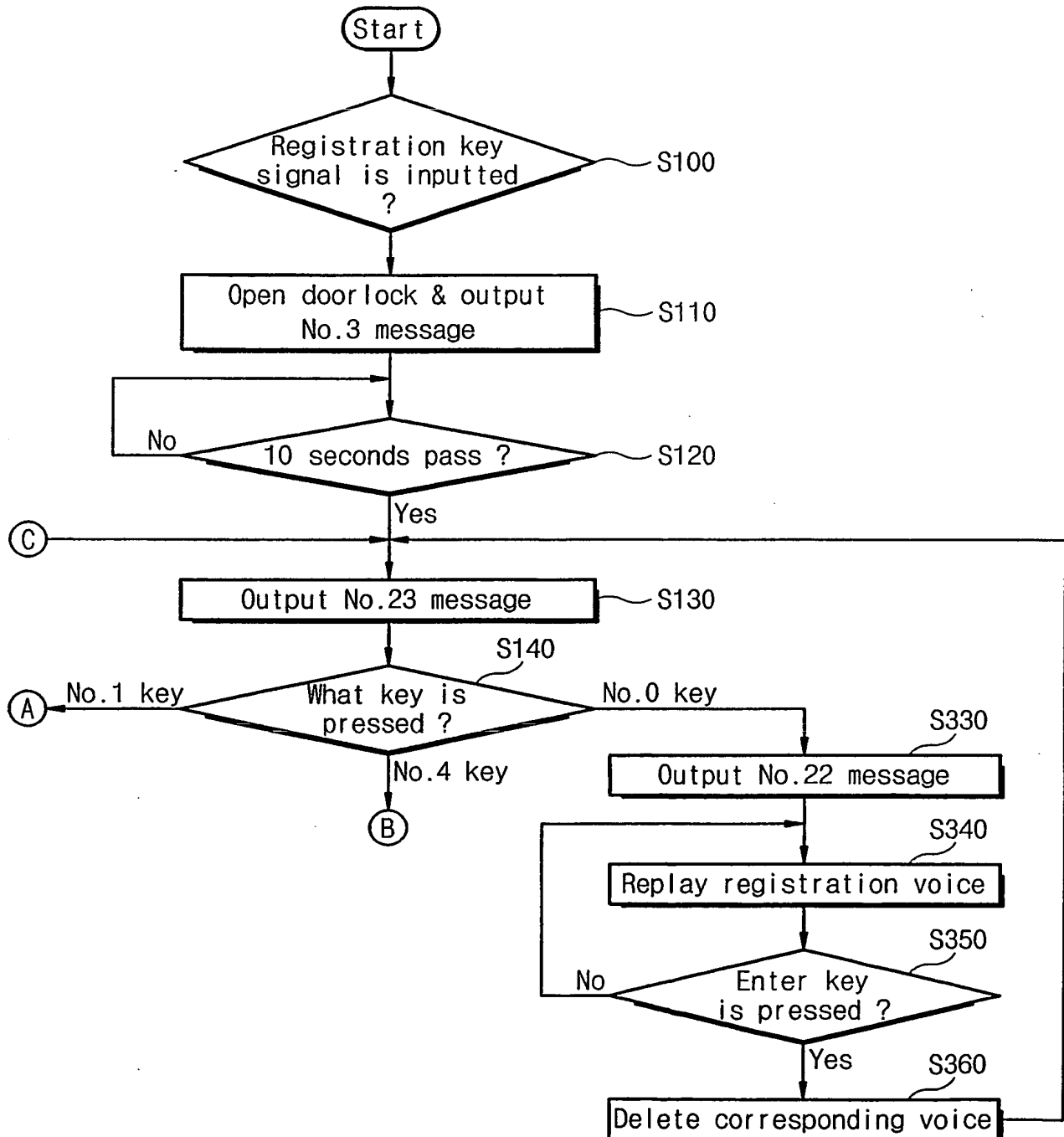
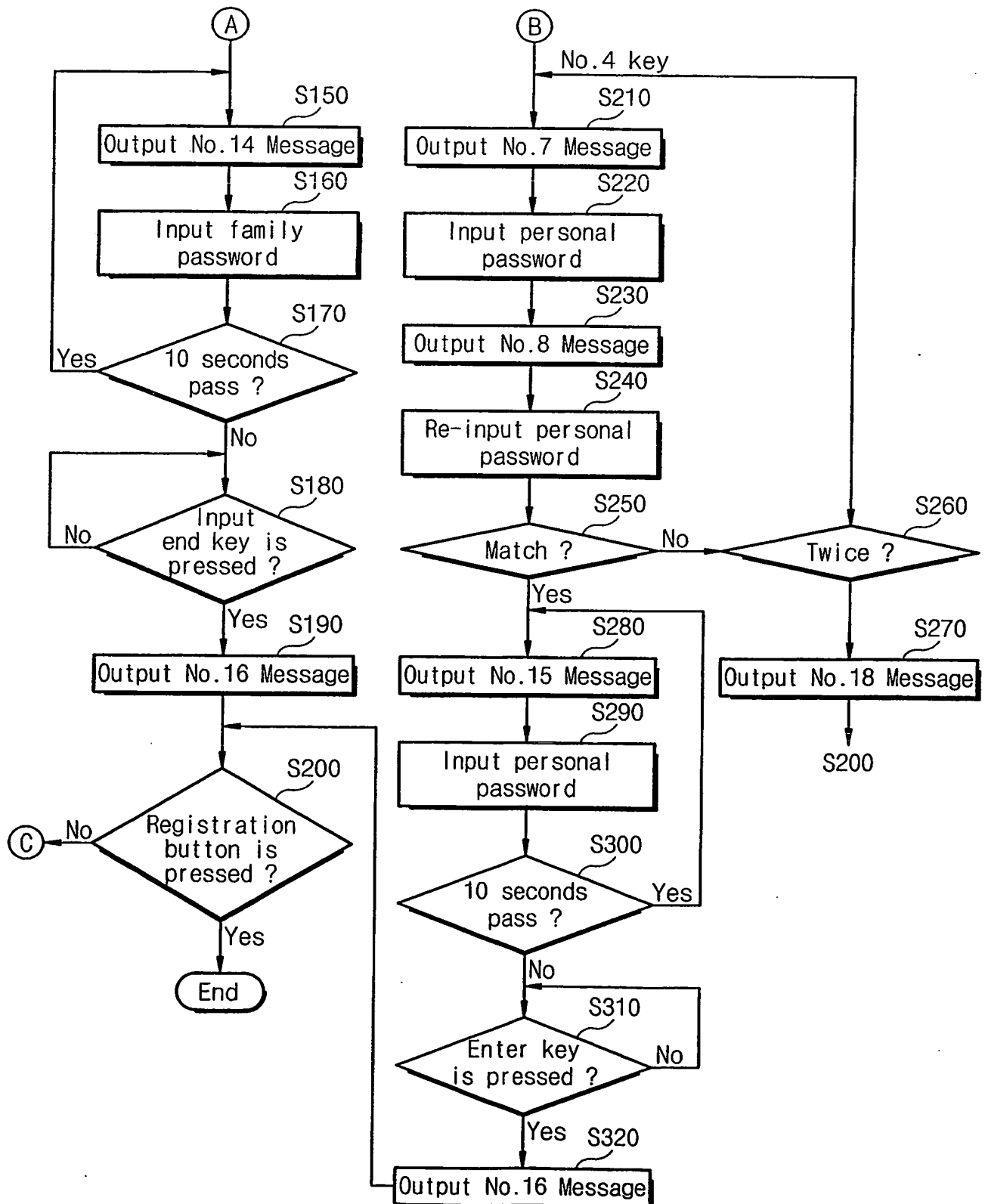


Fig. 2A



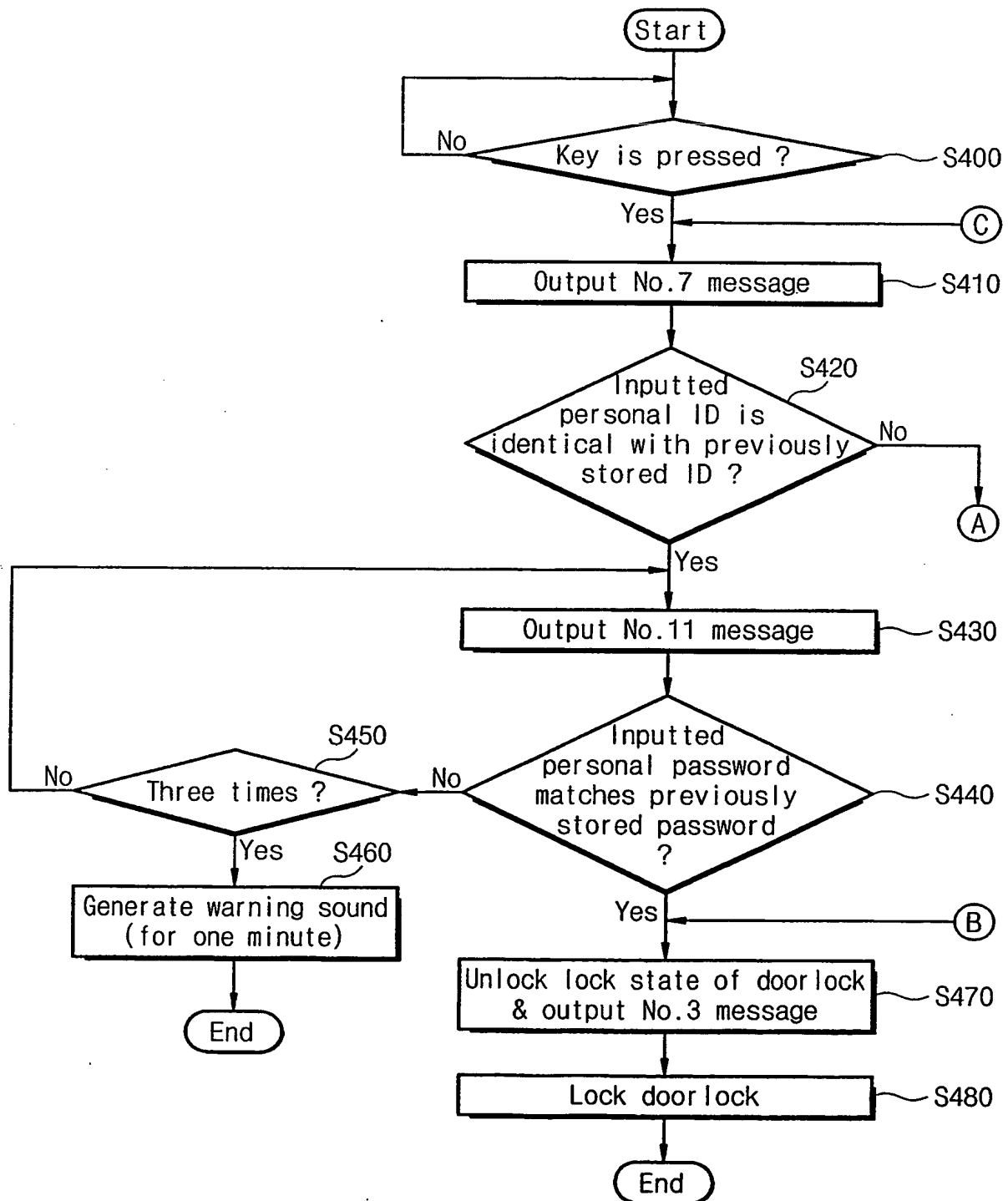
10/530010

Fig. 2B



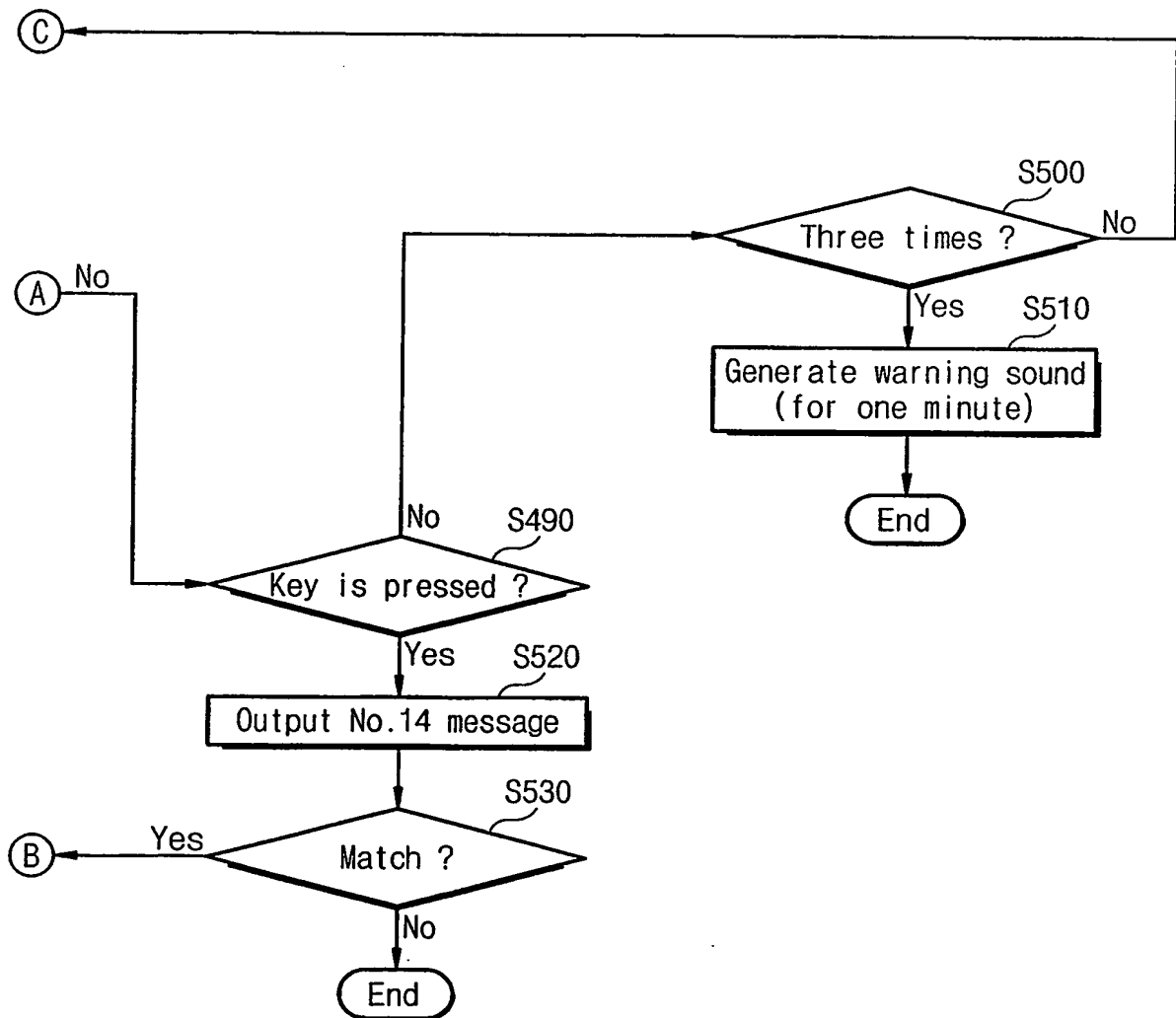
10/530010

Fig. 3A



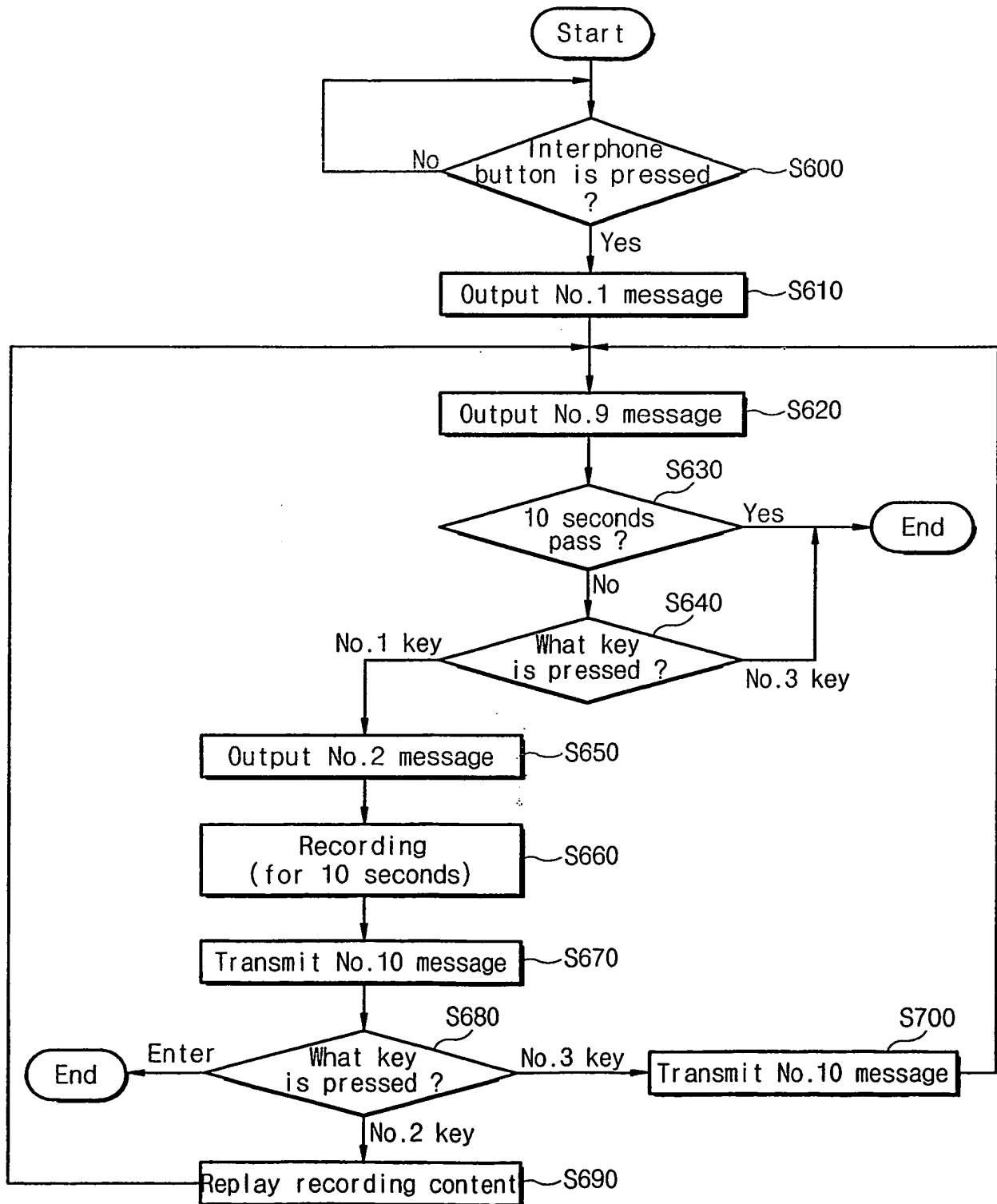
10/530010

Fig. 3B



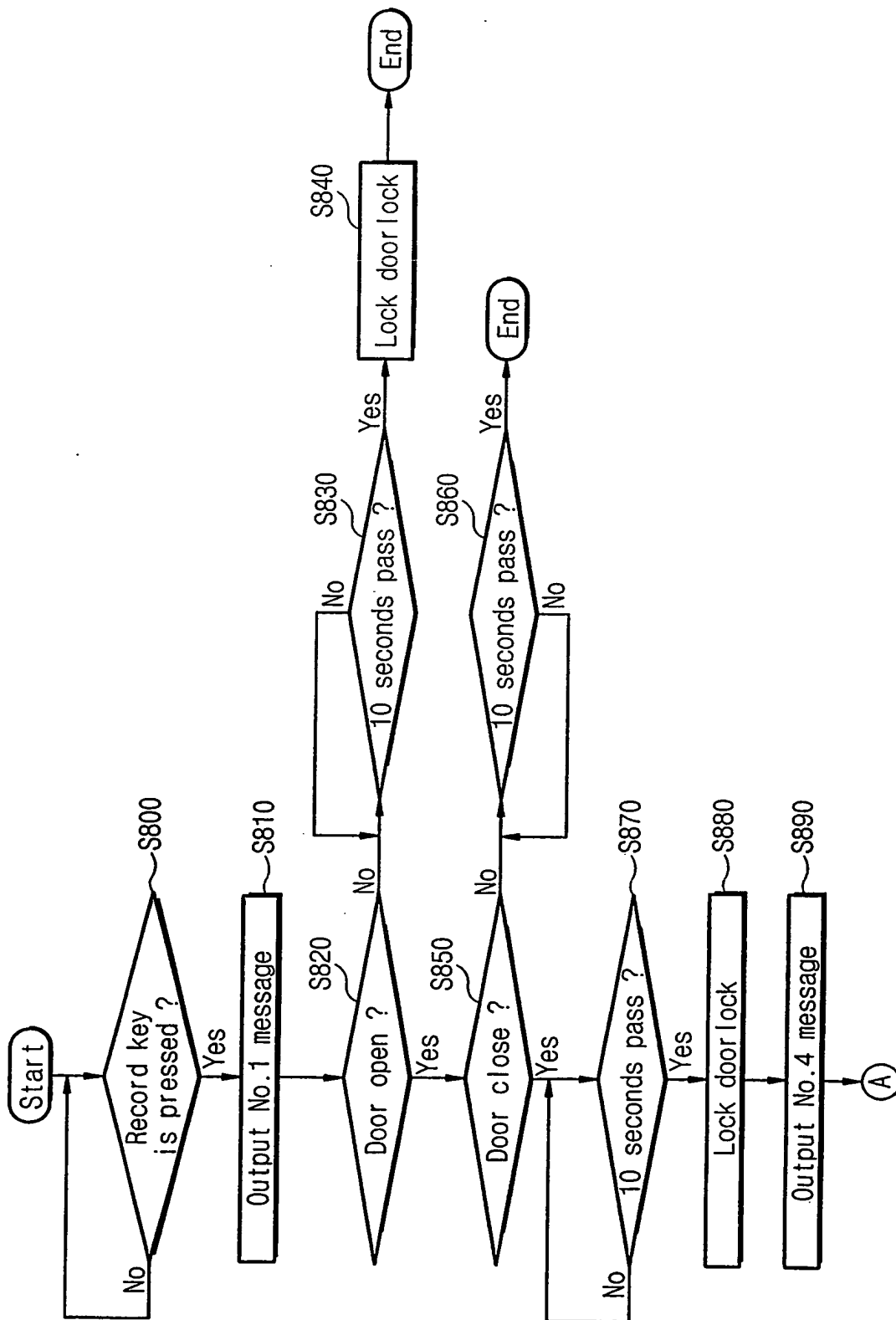
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Fig. 4



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Fig. 5A



10/530010

Fig. 5B

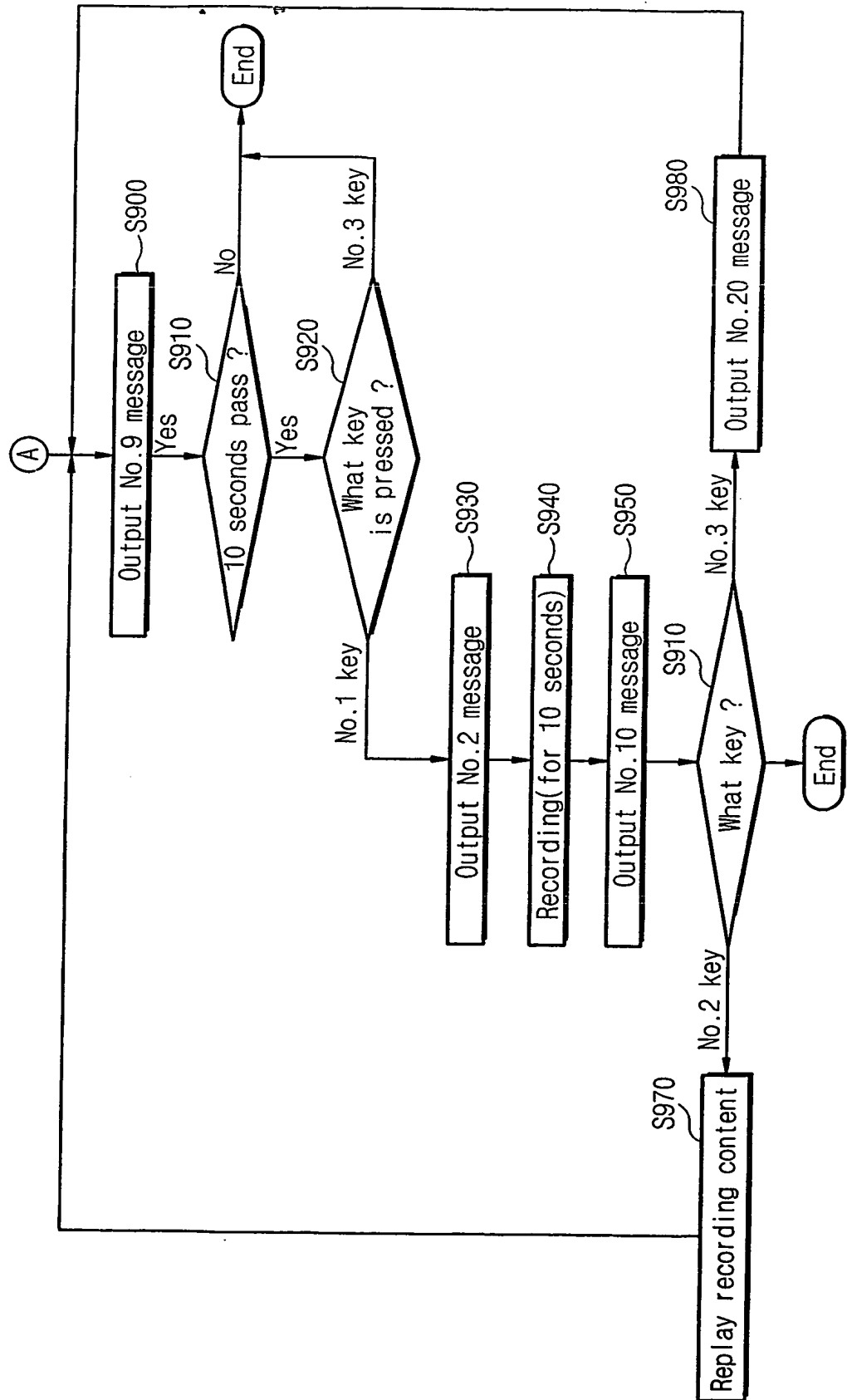


Fig. 6

| | |
|----|--|
| 1 | "Who is it." |
| 2 | "Speak." |
| 3 | "Door open." |
| 4 | "Door close." |
| 5 | "Close door." |
| 6 | "Change battery." |
| 7 | "Speak personal ID." |
| 8 | "Speak once more." |
| 9 | "No.1 is record, No.3 is cancel." |
| 10 | "Enter is end, No. 2 is replay, No.3 is cancel." |
| 11 | "press personal password." |
| 12 | "press number once more." |
| 13 | "Not correct number." |
| 14 | "Press enter key after pressing family password." |
| 15 | "Press enter key after pressing personal password." |
| 16 | "Registration end." |
| 17 | "Registration cancel." |
| 18 | "Not registered." |
| 19 | "Not registered any longer." |
| 20 | "Cancelled." |
| 21 | "Deleted." |
| 22 | "Delete if pressing enter key during replay." |
| 23 | "No.1 is family password registration, No.4 is user registration, No.0 is replay and delete." |

INTERNATIONAL SEARCH REPORT

International application No.
CT/KR2003/002022

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 E05B 49/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E05B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
KOREAN PATENTS AND APPLICATIONS FOR INVENTIONS SINCE 1975
KOREAN UTILITY MODELS AND APPLICATIONS FOR UTILITY MODELS SINCE 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
NPS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|---|-----------------------|
| Y | JP 05-287949 A (N T T DATA TSUSHIN CO., LTD) 02 NOV. 1993(02.11.1993) See the whole document | 1,3 |
| Y | JP 04-198575 A (FUJITSU GENERAL CO., LTD) 17 JULY 1992(17.07.1992) See the abstract, figure 2 | 2 |
| Y | JP 06-050036 A (MATSUSHITA ELECTRIC WORKS CO., LTD) 22 FEB. 1994(2.02.1994) See the abstract, figure 1 | 2 |
| Y | KR 1019960007974 A (DAEWOO ELECTRONICS CO., LTD) 22 MARCH 1996(22.03.1996) See the whole document | 1,3,8,9,10 |
| Y | JP 04-073384 A (FUJITSU GENERAL CO., LTD) 09 MARCH 1992(09.03.1992) See the abstract, figure 2,3 | 1,3 |
| A | JP 05-118172 A (FUJITSU GENERAL CO., LTD) 14 MAY 1993(01.05.1993) See the abstract figure 1,3 | 8,9,10 |
| Y | KR 1019970065939 A (PARK YOUNG-HO) 13 OCT. 1997(13.10.1997) See the abstract, figure 1 | 8,9,10 |

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

12 JANUARY 2004 (12.01.2004)

Date of mailing of the international search report

12 JANUARY 2004 (12.01.2004)

Name and mailing address of the ISA/KR



Korean Intellectual Property Office
920 Dunsan-dong, Seo-gu, Daejeon 302-701,
Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

MOON, Young Jae

Telephone No. 82-42-481-5406



PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING

To:
YIM, Chang-Hyun

3F, 827-25, Yeoksam-dong, Kangnam-gu, Seoul 135-080,
Republic of Korea

PCT 1 APR 2005

WRITTEN OPINION

(PCT Rule 66)

Date of mailing
(day/month/year) 11 OCTOBER 2004 (11.10.2004)

Applicant's or agent's file reference

REPLY DUE within 2 months from
the above date of mailing

International application No.

PCT/KR2003/002022

International filing date (day/month/year)

01 OCTOBER 2003 (01.10.2003)

Priority date(day/month/year)

01 OCTOBER 2002 (01.10.2002)

International Patent Classification (IPC) or both national classification and IPC

IPC7 E05B 49/00

Applicant

MIRERO TECHNOLOGY CO., LTD et al

1. This written opinion is the first (first,etc.) drawn by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

3. The applicant is hereby invited to reply to this opinion.

When ? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d)

How ? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3
For the form and the language of the amendments, see Rules 66.8 and 66.9

Also For an additional opportunity to submit amendments, see Rule 66.4
For an examiner's obligation to consider amendments and/or arguments, see Rule 66.4bis
For an informal communication with the examiner, see Rule 66.6

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 22 JANUARY 2005 (22.01.2005)

Name and mailing address of the IPEA/KR



Korean Intellectual Property Office
920 Dunsan-dong, Seo-gu, Daejeon 302-701,
Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

KIM, Yong Jae

Telephone No. 82-42-481-5674



I. Basis of the opinion

1. With regard to the elements of the international application:*

- ☒ the international application as originally filed
- ☐ the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the claims:
 pages _____, as originally filed
 pages _____, as amended (together with any statement) under Article 19
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the drawings:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language English which is

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the written opinion was drawn on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet/fig _____

5. ☐ This opinion has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed."

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

| | | | |
|-------------------------------|--------|-----------|-----|
| Novelty (N) | Claims | 1-10 | YES |
| | Claims | NONE | NO |
| Inventive step (IS) | Claims | 4-7 | YES |
| | Claims | 1-3, 8-10 | NO |
| Industrial applicability (IA) | Claims | 1-10 | YES |
| | Claims | NONE | NO |

2. Citations and explanations

인용문헌 (선행기술)

D1 : JP 05-287949 A

D2 : KR 97-065939 A

1) 신규성 (PCT Article 33(2))

인정됩니다.

2) 진보성 (PCT Article 33(3))

본원발명의 청구항 1-3, 8-10은 음성 인증을 통해 제어되는 도어록 장치에 관한 것으로서, 음성을 통한 인증과 비밀번호를 통한 인증을 결합하여 도어를 개방하는 사항; 방문자 또는 외출자가 안내되는 음성에 따라 소정의 음성 메시지를 입력하면 이를 저장하여 관리하는 사항; 으로 구성됨을 특징으로 하나,

D1에는 사용자의 음성 패턴에 의한 인증, 그리고 개인 번호에 의한 인증이 동시에 만족되어야만 개방되는 전자 도어 시스템이 개시되어 있고, D2에는 안내되는 음성에 응답하여 외출자가 음성 메시지를 저장하고 확인할 수 있도록 지원하는 전자식 도어록 시스템이 개시되어 있는 바,

상기 본원발명의 청구항 1-3, 8-10은 상기 D1, D2의 결합사상으로부터 당업자라면 용이하게 발명할 수 있는 정도의 것으로 판단됩니다.

3) 산업상 이용가능성 (PCT Article 33(4))

인정됩니다.

PCT

From the INTERNATIONAL BUREAU

NOTICE INFORMING THE APPLICANT OF THE
COMMUNICATION OF THE INTERNATIONAL
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:

YIM, Chang-Hyun
3F, 827-25, Yeoksam-dong
Kangnam-gu
Seoul 135-080
RÉPUBLIQUE DE CORÉE

01 APR 2005

| | | |
|--|--|--|
| Date of mailing (day/month/year) 15 April 2004 (15.04.2004) | | |
| Applicant's or agent's file reference XP13206-pct | | IMPORTANT NOTICE |
| International application No. PCT/KR2003/002022 | International filing date (day/month/year) 01 October 2003 (01.10.2003) | Priority date (day/month/year) 01 October 2002 (01.10.2002) |
| Applicant MIRERO TECHNOLOGY CO., LTD et al | | |

1. Notice is hereby given that the International Bureau has **communicated**, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this notice:

CN, JP, US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

None

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this notice is a copy of the international application as published by the International Bureau on 15 April 2004 (15.04.2004) under No. WO 2004/031515

4. **TIME LIMITS for filing a demand for international preliminary examination and for entry into the national phase**

The applicable time limit for entering the national phase will, **subject to what is said in the following paragraph**, be **30 MONTHS** from the priority date, not only in respect of any elected Office if a demand for international preliminary examination is filed before the expiration of **19 months** from the priority date, but also in respect of any designated Office, in the absence of filing of such demand, where Article 22(1) as modified with effect from 1 April 2002 applies in respect of that designated Office. For further details, see *PCT Gazette* No. 44/2001 of 1 November 2001, pages 19926, 19932 and 19934, as well as the *PCT Newsletter*, October and November 2001 and February 2002 issues.

In practice, **time limits other than the 30-month time limit** will continue to apply, for various periods of time, in respect of certain designated or elected Offices. For **regular updates on the applicable time limits** (20, 21, 30 or 31 months, or other time limit), Office by Office, refer to the *PCT Gazette*, the *PCT Newsletter* and the *PCT Applicant's Guide*, Volume II, National Chapters, all available from WIPO's Internet site, at <http://www.wipo.int/pct/en/index.html>.

For filing a **demand for international preliminary examination**, see the *PCT Applicant's Guide*, Volume I/A, Chapter IX. Only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination (at present, all PCT Contracting States are bound by Chapter II).

It is the applicant's **sole responsibility** to monitor all these time limits.

| | |
|---|--|
| The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland | Authorized officer Gijsbertus Beijer - Carlos Roy |
| Facsimile No.(41-22) 740.14.35 | Telephone No.(41-22) 338.91.11 |